

REMARKS

Rather than rewrite the original claims 1-11, Applicant has chosen to substitute new claims 12-25. However, Applicant's cancellation of the original claims is in no way a concession that those claims are anticipated by or obvious in light of the cited references. Instead, Applicant has narrowly tailored three sets of claims, one for each embodiment of the present invention, to clarify and better define the features of the present invention.

Applicant's invention is a tiny flexible pointing device that is designed to be adhesively bonded and, in some cases, vacuum sealed to the tip of a single human fingertip. The pointing device has a tip that is designed to depress or actuate diminutive keys on a keyboard, such as those found on miniature keyboards on input tablets. The tip of the pointing device is resilient enough to depress the keys, but flexible enough to provide comfort for the user. These competing objectives are achieved by the unique structural design and elements of the invention, which are captured by the newly written claims.

In contrast, the first cited prior art reference, *Levy*, is directed to a keyboard having a large, continuous elastomeric material with integrally molded keys. The keyboard of *Levy* and, to Applicant's knowledge, all keyboards are not designed and cannot be attached to a human fingertip. Even if a single key 22 (Figure 1) of *Levy* is examined, it has a completely different structure than Applicant's invention, and is designed to work with three other keys while mounted in the keyboard for simultaneous actuation of a single key function. In other words, *Levy* discloses keys that are so small, that four of them must be depressed at the same time to do one function. See Figures 1 and

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6. This teaches away from Applicant's invention which is to depress a single small key with one fingertip. The Examiner also states that *Levy* discloses "components [that] are adhesively put together." However, any adhesive used by *Levy* would be inside the keyboard, not external or in contact with fingertips. *Levy* is also void of disclosure of a vacuum for use between "the device" and a fingertip. Thus, it is incongruous to conclude that *Levy* anticipates or render obvious Applicant's invention.

The *Stracener* reference is another keyboard invention, but is directed to backlit illumination of the keys. Applicant first asserts that this reference is incompatible with *Levy* since *Levy* clearly discloses a very thin profile (i.e., very thin keys) design that is required to enable simultaneous actuation of four keys. To add the key thickness of *Stracener* in order to accommodate the back lighting assembly would disable the fine range of movement of *Levy's* keys. Notwithstanding this argument, *Stracener* still lacks almost all of the structural elements of Applicant's invention, as will be described below with respect to the claims.

Claims 12-16 are directed to the first embodiment (Figures 2 and 3) of the present invention, which comprises a two-piece, two-material design. Claim 12 requires many unique elements, perhaps the first of which is "a dome having...an axial opening located opposite the base surface." Neither of the references show such openings. In addition, claim 12 has "an axial cavity that tapers down from the base surface to the axial opening," which provides flexibility. None of the cavities in the references taper. Claim 12 also requires, "an axial dimension measured from the base surface to the axial opening, and a profile that is rotationally symmetric about the axis." All of *Levy's* keys

are rectangular--and necessarily so to enable simultaneous actuation of four of them. Moreover, the dome of claim 12 is "formed from a soft plastic material such that the dome is adaptable to a fingertip." This requirement and the preceding one make claim 12 completely inconsistent with *Levy*.

Claim 12 also has "a pin...located in and coaxial with the axial cavity of the dome, and the pin extending from the base surface of the dome through the axial opening of the dome such that the pin has an axial dimension that is greater than the axial dimension of the dome, and the tip of the pin extends axially beyond the axial opening of the dome. None of these multiple requirements are found in any reference or combination of references. Moreover, these structural limitations are so far removed from a keyboard structure that they are incomparable. Finally, claim 12 has "an adhesive layer joined to the base surface of the dome for adhering and securing the dome to the fingertip, the adhesive layer permitting repeated removal and rebonding with respect to the fingertip." Again, neither keyboard of the cited references has these limitations, and claim 12 is not obvious in light of their combination.

Claims 13-16 further distinguish the references by requiring additional unique elements. For example, claim 13 adds that "the base surfaces of the dome and the pin are co-planar to define a single contact surface for contacting the device with the fingertip." Even if the references had such base surfaces it is impossible to construe them in this manner. Claim 14 states that "the adhesive layer is circular and covers the entire base surfaces of both the dome and the pin, and wherein the adhesive layer is perforated for absorbing deposits of perspiration on the fingertip." Neither

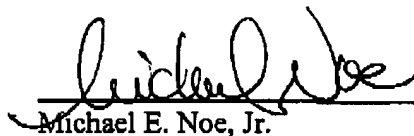
keyboard reference is capable of these requirements. Claim 15 adds the second material by claiming "the pin is formed from a material that is harder than the soft plastic material of the dome such that the pin is resilient for actuating keys, and wherein the dome is pressed back onto the fingertip during operation." Finally, claim 16 states that "the pin has an exterior profile that is contoured to a shape of the axial cavity of the dome." Each of these claims is allowable for the same reasons as claim 12 and for their own further distinguishing characteristics.

Claims 17-20 are directed to the second embodiment (Figures 4 and 5) of the present invention, which comprises a two-cavity, completely integrated design. Assuming that the cited references could be characterized in the same manner (Applicant maintains that they cannot), each reference discloses keyboard keys with only one cavity. More specifically, claim 17 requires "a dome having...an outer wall, an inner wall, an outer cavity located between the outer and inner walls adjacent to the perimeter, an inner cavity located radially inward of the inner wall relative to the axis, the inner cavity having an axial dimension that is greater than an axial dimension of the outer cavity, the entire dome being formed from a single material such that the dome molds to a fingertip but is hard enough for the tip to actuate keys, and each of the inner and outer cavities forming a vacuum between the dome and the fingertip." This unique structure, and the vacuum requirement, are so different from the keys of the cited references that they cannot be compared. Like claim 12, claim 17 requires an adhesive layer joined to the base surface of the dome for adhering the dome, along with the vacuums formed by the inner and outer cavities, to the fingertip, the adhesive layer permitting repeated removal and rebonding with respect to the fingertip. The remaining claims require symmetry among all of the components, co-planarity, and adhesive and cavity contact to form

both bonding and vacuum retention, respectively. The final set of claims, 21-25, are directed to the third embodiment of Figures 6 and 7, which again is a two-piece, two-material design. These claims require many of the same elements as the preceding claims, while requiring their own unique structural limitations.

It is respectfully submitted that the claims are in condition for allowance and favorable action is requested. No extension of time is believed to be required. However, in the event that an extension of time is required, please charge that extension fee and any other required fees to **IBM Corporation Deposit Account Number 50-0563.**

Respectfully submitted,



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REDACTED VERSION OF THE CLAIMS

Cancel claims 1-11.

- 1 1. (Canceled) An actuating device for miniature keyboards and input tablets, comprising:
2 an actuating element adapted to the size of keys and tablet fields of palmtop computers, the
3 actuating element having a dome (12) adapted to the curve of a fingertip such that the dome can be
4 fitted to the fingertip by means of a removable adhesive bond, and wherein the dome has a pin-
5 shaped projection (14) on a convex side which serves as an actuating member.
- 1 2. (Canceled) The actuating device in accordance with Claim 1, wherein the dome (12) is made
2 of a soft plastic material which molds to the fingertip.
- 1 3. (Canceled) The actuating device in accordance with Claim 1, wherein a concave side of the
2 dome (12) is joined to an adhesive layer (18) which permits repeated fitting and removal of the dome
3 to and from the fingertip.
- 1 4. (Canceled) The actuating device in accordance with Claim 3, wherein the adhesive layer (18)
2 is perforated.
- 1 5. (Canceled) The actuating device in accordance with Claim 1, wherein a concave side of the
2 dome is joined to a ring-shaped layer (28) which bears an adhesive material, and the dome forms a
3 cavity (24) within the ring-shaped layer that acts as a suction cup when the dome is fitted on the
4 fingertip.
- 1 6. (Canceled) The actuating device in accordance with Claim 5, wherein a circumference of the
2 dome is circular in shape.

1 7. (Canceled) The actuating device in accordance with Claim 5, wherein the pin-shaped projection
2 (22) has a funnel-shaped extension (25) that protrudes into the cavity (24) as far as the rim (21) of
3 the dome to form another cavity (26) that acts as another suction cup when the dome is fitted on the
4 fingertip.

1 8. (Canceled) The actuating device in accordance with Claim 5, wherein the dome (20, 30) and
2 the pin-shaped projection (22, 32) are manufactured as one piece.

1 9. (Canceled) The actuating device in accordance with Claim 1, wherein, in order to form the pin-
2 shaped projection (14), a pin is inserted into an opening in the dome (12) and joined to the dome (12)
3 and to an adhesive layer (18).

1 10. (Canceled) The actuating device in accordance with Claim 1, wherein the dome (30) is joined
2 on a concave side to a ring-shaped layer (36) which bears an adhesive material, and that the dome
3 forms a bell-shaped chamber within the ring-shaped layer which is filled out by an inlay (38) made
4 of a felt-type material.

1 11. (Canceled) The actuating device in accordance with Claim 10, wherein the dome (30) has a thin
2 wall (34) which has a central area that merges into the pin-shaped projection (32).

Add the following new claims:

1 12. (New) A device for actuating small keys on miniature keyboards, input tablets, and the like,
2 comprising:

3 a dome having an axis, a base surface, an axial opening located opposite the base surface, an
4 axial cavity that tapers down from the base surface to the axial opening, an axial dimension
5 measured from the base surface to the axial opening, and a profile that is rotationally symmetric

6 about the axis, the dome being formed from a soft plastic material such that the dome is adaptable
7 to a fingertip;

8 a pin having an axis, a base surface, and a tip, the pin being located in and coaxial with the axial
9 cavity of the dome, and the pin extending from the base surface of the dome through the axial
10 opening of the dome such that the pin has an axial dimension that is greater than the axial dimension
11 of the dome, and the tip of the pin extends axially beyond the axial opening of the dome; and

12 an adhesive layer joined to the base surface of the dome for adhering and securing the dome to
13 the fingertip, the adhesive layer permitting repeated removal and rebonding with respect to the
14 fingertip.

1 13. (New) The device of claim 12, wherein the base surfaces of the dome and the pin are co-
2 planar to define a single contact surface for contacting the device with the fingertip.

1 14. (New) The device of claim 12, wherein the adhesive layer is circular and covers the entire
2 base surfaces of both the dome and the pin, and wherein the adhesive layer is perforated for
3 absorbing deposits of perspiration on the fingertip.

1 15. (New) The device of claim 12, wherein the pin is formed from a material that is harder than
2 the soft plastic material of the dome such that the pin is resilient for actuating keys, and wherein the
3 dome is pressed back onto the fingertip during operation.

1 16. (New) The device of claim 12, wherein the pin has an exterior profile that is contoured to a
2 shape of the axial cavity of the dome.

1 17. (New) A device for actuating small keys on miniature keyboards, input tablets, and the like,
2 comprising:

3 a dome having an axis, a perimeter, a base surface extending around the perimeter, a tip located
4 opposite the base surface, an outer wall, an inner wall, an outer cavity located between the outer and
5 inner walls adjacent to the perimeter, an inner cavity located radially inward of the inner wall relative

6 to the axis, the inner cavity having an axial dimension that is greater than an axial dimension of the
7 outer cavity, the entire dome being formed from a single material such that the dome molds to a
8 fingertip but is hard enough for the tip to actuate keys, and each of the inner and outer cavities
9 forming a vacuum between the dome and the fingertip; and

10 an adhesive layer joined to the base surface of the dome for adhering the dome, along with the
11 vacuums formed by the inner and outer cavities, to the fingertip, the adhesive layer permitting
12 repeated removal and rebonding with respect to the fingertip.

1 18. (New) The device of claim 17, wherein each of the perimeter, the base surface, the tip, the
2 outer wall, the inner wall, the outer cavity, and the inner cavity are rotationally symmetric about the
3 axis.

1 19. (New) The device of claim 17, wherein the base surface and a portion of the inner wall are
2 co-planar for contacting the fingertip.

1 20. (New) The device of claim 17, wherein the adhesive layer is circular and covers only the base
2 surface of the dome, such that the inner cavity, the inner wall, and the outer cavity are exposed for
3 direct contact with the fingertip.

1 21. (New) A device for actuating small keys on miniature keyboards, input tablets, and the like,
2 comprising:

3 a dome having an axis, a perimeter, an annular base surface located adjacent to the perimeter,
4 a tip located opposite the base surface, a convex exterior, an axial cavity that is concave in shape and
5 tapers down from the base surface toward the tip, the axial cavity having an axial dimension that is
6 less than an axial dimension measured from the base surface to the tip, and a profile that is
7 rotationally symmetric about the axis, the dome being formed from a material that is adaptable to
8 a fingertip;

9 an inlay located in and coaxial with the axial cavity, the inlay having an axis, and a base surface,
10 the inlay extending from the base surface of the dome and filling the entire axial cavity of the dome,

11 such that the inlay has an axial dimension that is less than the axial dimension measured from the
12 base surface of the dome to the tip of the dome, the inlay being compressible such that a vacuum is
13 formed between the dome and the fingertip; and

14 an adhesive layer joined to the base surface of the dome for adhering and, along with the
15 vacuum formed by the inlay, securing the dome to the fingertip, the adhesive layer permitting
16 repeated removal and rebonding with respect to the fingertip.

1 22. (New) The device of claim 21, wherein the inlay is lenticular in shape and formed from a felt.

1 23. (New) The device of claim 21, wherein the base surfaces of the dome and the inlay are co-
2 planar to define a single surface for contact with the fingertip.

1 24. (New) The device of claim 21, wherein the inlay has an exterior profile that is contoured to
2 a shape of the axial cavity of the dome.

1 25. (New) The device of claim 21, wherein the adhesive layer is circular and covers only the base
2 surface of the dome, such that the base surface of the inlay is exposed for direct contact with the
3 fingertip.